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AUTHOR MacLeod, Murdo J.; Barkowski, Casimir
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ABSTRACT

This report from the Senate Library Committee at the University of Pittsburgh evaluates a widely publicized study of monograph and periodical use conducted at Pitt by Professor Allen Kent and his associates from 1975-1977. Areas of the study which are examined include structure in text and footnotes, and experimental design, execution, and manipulation of data, in terms of holdings, use, and costs. In particular, the use of "sampling," accuracy of "official figures," comparative method, and cost benefit model of the study are questioned. The Kent study had produced conclusions the committee considers invalid: that Pittsburgh libraries are spending too much money on books and periodicals which are seldom or never used. Findings of the Kent study represent impetus for a change in acquisitions policy, but the committee strongly discourages acceptance of these recommendations because it feels that the study is improperly presented and contains some inaccuracies. (Author/SW)

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THE SENATE LIBRARY COMMITTEE

UNIVERSITY OF PITTSBURGH

Report

on

The Study of Library Use at Pitt by Professor Allen Kent, et al.

(A Pittsburgh Reply)

Murdo J. Mac Leod

and

Casimir Borkowski

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July, 1979

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1.0 Introduction

1.1 Why This Report?

A widely publicized study of library use at the University of Pittsburgh, a study conducted by Professor Allen Kent and his associates, has generated a good deal of controversy and concern as it has reached the public in its various stages. The breadth of interest in what has come to be known as the "Pittsburgh Study," the "Kent-Galvin Study,"or the "Kent Study" (KS) is readily understandable. Indeed, the Library Journal itself was interested to report Professor Kent's claim that research libraries in general and the University of Pittsburgh libraries in particular"...are spending too much much money on books and periodicals that are little used or not used at all...acquisitions people are confusing quantity with quality..." ["Pitt study pegs faulty acquisition patterns" (an editorial) Library Journal, July, 1977, p. 1438]. As financial cuts force ever more university administrators to concern themselves with the costs of erasers and ditto paper, such a claim as this must have an electric effect--the annual acquisitions budget for Pitt's Hillman Library alone is nearly a million dollars. A substantial savings here is a substantial savings indeed.

Important policy decisions are obviously at stake. Consequently, Pitt faculty, administrators, and librarians have repeatedly urged the Senate Library Committee (SLC) to undertake an evaluation of KS. In order to fulfill its mandate as a Senate "watchdog committee," the SLC has complied with these requests and is reporting here on the results of its investigation.

1.2 The Background

Kent and his associates labored from 1975 to 1977 with the support of a $140,000 grant from the National Science Foundation. Their motivation was

the felt need for long-range acquisitions policies for Pitt libraries and for research libraries in general. Their objective was to provide statistical data on the extent to which library materials--books, monographs, and journals--are used by patrons and the full costs of such use. Further studies, designed to establish the costs of resource sharing, are projected. The ultimate objective is to compare the costs of inhouse provision of library materials with resource sharing and to calculate the difference.

Kent et al, explained their root hypotheses as follows:

> "It was our expectation that much of the material purchased for a research library was little or never used, and that the costs entailed are beyond ordinary expectations. This expectation has been substantially supported by the study's findings" (Final Report, p. ii and p. 176).

The subject of KS was Pitt's Hillman Systems Libraries with current holdings of some 1,525,000 volumes (plus 900,000 microforms), an annual budget of about $3,725,000, current acquisitions of approximately 53,000 books and monographs, and about 10,000 current subscriptions (1978 figures).

The information concerning the use of books and monographs at Hillman was derived from (1) a machine-readable file consisting of circulation and acquisition data for the years 1969 - 1975, (2) the data on interlibrary loans and some information on reserve book use, and (3) a sample of inhouse use of books and monographs.

The information concerning the use of journals was derived form a sample of observed uses at five departmental libraries [Physics, Langley (Life Sciences and Psychology), Bevier (Engineering), Chemistry, and Computer Science] and supplemented by questionnaires.

Professor Kent summarizes the findings of the Kent Study as follows:

> "Additions of books and monographs to the Hillman Library collections showed similar patterns of use over the years. For example, for acquisitions, 40 percent did not circulate externally in seven years. When a book does not circulate within the first six years of ownership, the

likelihood of its ever being borrowed is less than one chance in fifty. The sampling of journal usage similarly confirmed that use is confined to a very small portion of the journal collection.

Two methods were followed in estimating the cost of book use: one treating acquisitions as a fixed cost, the other treating them as a variable cost. The results suggested that costs are beyond ordinary expectations--more than $50 per "new" book circulation on the most liberal accounting basis.

In-house use was also sampled: 74 percent of the titles used in-house had also circulated previously. Over time, the percentage of matches between external circulation and in-house use can be expected to increase. External circulation data over an extended time period can be utilized with a high level of confidence to measure total book use--in terms of items used, not frequency.

A methodology has been suggested for identifying "high risk" and low risk" in book ordering by LC class, based on average cost of book use and its standard deviation.

From the standpoint of applicabilty to other libraries, the study suggests (1) a methodology for estimating library use; (2) a methodology for estimating the cost of book use; (3) a "risk analysis" approach to making acquisitions decisions; and (4) a framework for future estimation of cost-effectiveness and cost-benefit of library operations" (Allen Kent, "Crystal Gazing into the Future," Journal of Library Automation, December, 1978, Vol. 11/4, p. 329).

To date, the Kent Study has resulted in the following set of widely publicized documents:

(1) A Cost-Benefit Model of Some Critical Library Operations in Terms of Use of Materials, by Allen Kent, K. Leon Montgomery, Jacob Cohen, James G. Williams, Stephen Bulick, William Sabor, Roger Flynn, and Donald Shirey.

Grant No. SIS 75-11840 and DSI 75-11840 A02 National Science Foundation.

Progress Report, April 1, 1977; revised April 29, 1977.

(2) Thomas J. Galvin and Allen Kent: "Use of a University Library Collection, A Progress Report on a Pittsburgh Study", Library Journal, November 15, 1977, pp. 2317-2320.

(3) Allen Kent et al., Final Report; Draft, November 11, 1977; Revised, April 15, 1978 (available from NTIS).

As mentioned in (1.1) above, the Kent Study of book and journal use at Pitt has attracted a great deal of attention and has generated much controversy both at the University of Pittsburgh and nationally. Based on his investigation of the University of Pittsburgh libraries, Professor Kent states:

> "The hard facts are that research libraries invest very substantial funds to purchase books and journals that are rarely or never, called for, as well as equally large sums to construct and maintain buildings designed to make accessible quickly titles some substantial portion of which are no longer either useful to or sought by their clientele" (Final Report, A Cost-Benefit Model..., p. 2).

However, there are many at the University of Pittsburgh and elsewhere who question the validity of the hypotheses, research methods, conclusions, and recommendations put forward by Professor Kent and his colleagues in their study of book and journal use at the University of Pittsburgh.

A typical adverse comment is as follows:

> "There can hardly be any misunderstanding about our reaction to the report produced by Professor Kent and his colleagues. Its implications are highly detrimental to the mission of a university and it fails to adequately acknowledge the dangers it entails. As a piece of policy analysis, it is remarkably superficial and unidimensional. It fails to comprehend seriously either what a university is or to appreciate how sensible cost reductions might be achieved. Let us hope that it will be considered and analyzed seriously, however, for we are convinced that cold, sober analysis will reveal the enormous defects of its policy recommendations and its reasoning" (Pitt's Faculty Library Representatives, A Comment on "A Cost-Benefit Model of Some Critical Library Operations in Terms of Use of Materials" by Allen Kent, et al, Mimeo: University of Pittsburgh, February 1978, p. 10).

In view of:

- the very strong statements made by Professor Kent and his associates about the non-use of books and journals at Pitt;
- the national publicity given to these statements and their resulting eminence;

- the controversy engendered locally at Pitt by these statements, e. g., the report of the Faculty Library Representatives, various panels on Professor Kent's study, the letter of 16 members of the Hillman Library Bibliographic Unit (stating that KS is damaging to the Library, its staff, and the University Community), the letter of Professor Galvin (whose reply to Hillman librarians vouches for the correctness of KS's methodology and results), various statements in the University Times,(1)
- the controversy engendered nationally by these statements, e.g., editorials in Library Journal,(2) (3) the Library Journal article by Professors Galvin and Kent,(4) the Journal of Academic Librarianship symposium on KS,(5)
- the policy implications of the Kent Study for Pitt and other academic institutions;

in view, then, of all these considerations, the SLC accepted the charge to investigate KS and is reporting here on the substance of its findings.

2.0 How the Kent Study Presents Its Findings

2.1 "The Cost-Benefit Model"

The title of the KS is misleading. KS does not, in fact, provide a cost-benefit model of library operations. A cost-benefit analysis requires a common measurement for both costs and benefits. Because the costs of journal use are measured in dollars and cents, therefore the benefits should also be so measured. A real cost-benefit analysis of journal use, for example, would be computed by multiplying the total number of journal uses by the (average) benefit, in dollars and cents, from each journal use. This total of benefits from the use of journals could then be compared with the total cost, in dollars and cents. In spite of its title, A Cost-Benefit Analysis Model of Some Critical Library Operations in Terms of Use of Materials, KS does not, in fact, perform any cost-benefit analysis of any aspect of Pitt library operations.

Indeed, KS's entire treatment of the cost-benefit model is replete with conflicting statements. Thus, on page ii of the Final Report we are told that KS is "less of a cost-benefit study than one emphasizing cost-effectiveness. Benefits have not been estimated in the present study." Further on, however, page 1, we find that "The aim . . . was to develop a cost-benefit model of some critical library operations in terms of use of materjals." And finally, on page 2, we read that "there are no objective means for measuring benefits from materials use." Should the reader then assume, in spite of the title and the confusion, that he is in the presence of a cost-effectiveness study? Back to page ii, where we read,

"The ultimate purpose of the study can perhaps be stated in terms of a simple equation: X-Y=Z, where X represents the in-house costs of furnishing library services (book use), Y the comparative costs of resource sharing, and Z the difference . . . ."

"Y" has not been studied, not even estimated in KS.

We consider that the issues raised by the use of a misleading title for such a widely circulated study are hardly resolved by the brief paragraph quoted above about the "ultimate purpose" of KS--particularly when "X" has been estimated provably incorrectly and "Y" has not been estimated at all. (This report will go on to demonstrate that KS is not an accurate study of "X.")

The Final Report, the Progress Report, and the published distillations of KS's findings contain many similar contradictions. We find assertive declarations as to the definitiveness of the findings mingled with many qualifications and reservations. A few examples will illustrate this problem.

"It was our expectation that much of the material purchased for a research library was little or never used, and that the costs entailed are beyond ordinary expectations. This expectation has been substantially supported by the study's findings" (page ii).

But the following two pages contain little else but a chronicle of exceptions and caveats. There were omissions which were to be returned to later (p. ii). The collaborators were unable to obtain accurate baseline data from the librarians, so they went on regardless (page iii). KS can argue that "The hard facts are that research libraries invest...large sums to construct and maintain buildings designated to make accessible quickly titles some substantial portion of which are no longer useful to or sought by their clientele" (Final Report, p. 2); that "acquisitions people are confusing quantity with quality" (Library Journal, July 1977, p. 1438); that, in a word, "Responsible library management would seem to demand a major revision of library acquisition policies" (Final Report, p. 3). Of course, we understand that KS is to provide the torch to light the way of these "responsible" library managers. But, if KS can thus argue, on the one hand, that academic librarians are spending too much money on books and periodicals that are little used or not used at all; that, baldly put, "responsible library management would seem to demand a major revision of library acquisition policies," KS can as nimbly tuck away an in petto escape clause that "It is not

clear whether a book and monograph usage rate of 56% - 60% is good or bad in a university environment" (Final Report, p. 177). One might argue, of course, that these are mere matters of organization, of style, of taste. This may be, although we believe that such backing, filling, and shifting is significant and indicative. Of far more importance is the KS use of the comparative method.

2.2 The Comparative Method

KS attempts first to prove that the present systems of book and journal acquisition are not as effective as they could or should be and then to suggest some possibilities for improvement. Hillman Library at the University of Pittsburgh is the "locus" of the book study, and several libraries at the University of Pittsburgh are the "loci" of the journal study (see the list on page 52 of the Final Report). KS is then a "case study" in the generally accepted, scholarly meaning of that expression, and Pitt, or more specifically the Hillman Library, is the "case" as far as books are concerned.

Yet, nowhere in KS is there a description, even a summary description, of the present systems for book (or journal) selection or acquisition at Hillman (or Pitt). The systems used at Hillman are well known. They involve several kinds of decision making, and interaction between bibliographers and faculty representatives (typically one from each department or school).

How then does KS establish a "base point" for its comparative case study? What is the flawed system of selection and acquisition which is to be improved by KS suggestions?

KS provides for this purpose a series of assertions about libraries and their acquisition and selection policies in general. Librarians, we are told, like "to have complete 'runs' of materials, particularly journals" (Final Report, page 2). In fact, following DeGennaro, KS believes that this situation is chronic: " . . . old habits die hard." Again, KS quoting DeGennaro:

> "Librarians have a weakness for journals and numbered series of all kinds. Once they get Volume 1, Number 1 of a series they are hooked until the end" (both quotations on page 3 of the Final Report).

Probably none of the above statements is true, but the DeGennaro statement certainly does not describe the situation at Pitt. For example, from 1973 to 1978 (both dates inclusive), Pitt's Bevier Library (engineering) cancelled 114 subscriptions and Langley Library (life science and psychology) cancelled 74 paid subscriptions, two "exchange" subscriptions, and seven subscriptions to abstracts/indexes. For another example, the Library Committee of Pitt's English Department spent more than six months analyzing the relative worth of each of the hundreds of journals of interest to members of the department--this in an attempt to react as responsibly as possible to the library's plea for guidance in cancelling and ordering journals. In fact, for some five years there has been a system of "add one, cut one," at least as far as Hillman journals are concerned.

KS also assures us that librarians "frequently" do not ask themselves if "books bought are used" (Final Report page 3, KS emphasis). In fact, librarians frequently ask faculty representatives to justify orders by outlining the prospective uses or users of books before ordering them.

In previous versions of KS, and in published reports on its findings, none of which has been retracted, it is also claimed that undue faculty pressure is partly responsible for the relative size of some library budgets and for the purchase of books, monographs, and journals which will not be used.

> "In part, the slowness of librarians to act on what we now know to be true (sic!) reflects both the politics of the academic world, where the departmental book budget is the most sacred of sacred cows, and our collective reluctance to accept the unpleasant prospect that the new depression in higher education is not a temporary fiscal indisposition but a long-term malady" (Thomas J. Galvin and Allen Kent, "Use of a University Library Collection: A Progress Report on a Pittsburgh Study," Library Journal, November 15, 1977, page 2317. See also page 2320 which repeats this assertion, " . . . purchase decisions are often made in response to campus political pressures").

In the Progress Report to the final KS these views are stated in even stronger form:

> "In the absence of data, decisions are often made on the basis of political power. This hypothesis seems to hold in the library context with regard to individual faculty requests or library committee requests. That is, it is sometimes difficult for a professional librarian to exercise professional judgments in view of the political pressures" (pages 35-36).

Readers of these "progress reports" were, of course, left to assume that these unsubstantiated claims would receive their full measure of documentation in the Final Report. One is reminded of the gentleman in the lab coat who interrupts the evening news to assure us that the document he holds in his hand contains the results of a laboratory study proving .... Whatever may be in the hands of the gentleman on the television, KS's Final Report does not contain the documentation which the Progress Report and the Galvin-Kent article in the Library Journal had led us to expect; indeed, widely publicized as they had been, the statements as to the political pressures which force librarians' decisions are dropped from the Final Report--but without explicit acknowledgement to this effect. Earlier criticisms of librarians and faculty are side-stepped rather than withdrawn.

In fact, at the University of Pittsburgh's Hillman Library, the size of each departmental budget, e.g., in the Faculty of Arts and Sciences, is decided by the Coordinator of Library Resources, given the total budget made available to her by the Director of the Hillman Library. There is no faculty input at this stage. The faculty representative of each department or school is then told what his/her departmental budget will be for the fiscal year. Faculty commonly do not know the size of the library budget in departments other than their own. It has been agreed by faculty-representative groups over the years that the library resources unit is better placed than any faculty group to "divide the pie." This is common knowledge among bibliog-

raphers and faculty representatives at the Hillman Library.

Acquisition and selection at Hillman Library is an integrated system, including discussion and cooperation between librarians and faculty. None of this is secret or difficult to discover. Both faculty library committees—such as the Senate Library Committee and the Executive Committee for Libraries—and librarians at Hillman, however "reluctantly," have accepted the fiscal problems facing the library for many years, and much of their discussion, as minutes would show, has been devoted to ways of coping with these exigencies.

In fact, what KS has done is to construct a model of library acquisition and selection policies in vague and general ways, ways which often do not apply at all to Hillman Library, the "locus" of this case study. In logic this is sometimes called the fallacy of division or "the leap from the general to the particular."

2.3 The Use of Footnotes

Mr. Homer Bernhardt, the Bevier librarian, makes the following statement with respect to KS's use of footnotes:

> "The draft of the Final Report has one of the professors using 1,485 for the 'number of titles' in the Engineering Library, and another one using 1,643 (pp. 108 & 57). The "subscription costs" include $9,072 for indexes and abstracts which were not part of the study (p. 108). When both of these discrepancies were pointed out to them, the figure for the 'number of titles' was changed from 1,485 to 1,643 (Final Report, p. 107), but the amount for 'subscription costs' was only footnoted! Why is it that the higher cost figures are highlighted in the body of the text or on the tables, and modified to lower figures by footnotes? The 'subscription cost/use' for the Engineering Library is shown to be $6.81 on pages 67 and 107 of the Final Report. Footnote 7 on page 111 drops it to $5.43. The 'average cost per use' is given as $9.04 on pages 67 and 111, but is lowered to $7.21 in footnote 7 on page 111. Although these figures are just as wrong as the result of their faulty sampling and methodology, it is important to bring them to your attention in this light because of the widespread and national publicity that the KS has been given" (Homer I. Bernhardt, "Pitfalls of the Pitt Study," American Society for Engineering Education, Annual Conference, (Proceedings), June 25-28, 1979, Louisiana State University).

We, too, would like to question KS's procedure for using footnotes. Is it proper, from the scholarly point of view, to put admittedly inflated figures into tables and less inflated figures into footnotes below? (Final Report, Table 80, p. 107, footnote 1)

Is it proper from the scholarly point of view to place admittedly inflated figures into tables and less inflated figures in footnotes several pages away from the tables? See for example, a footnote on page 111 which is referenced to a table on p. 107, and Table A4 on p. 135, which is referenced to a footnote on p. 111. Some admittedly inflated figures (e.g., page 67) are not footnoted at all.

Professor Kent states on page iii of the Final Report:

> "There was a continuing problem of obtaining agreement as to precise baseline data. For example, our original figures for acquisition of books and monographs led to "official" figures being issued, which suggested a slightly lower number acquired, to take into account books that had disappeared since acquisition. So, late in the game, in order to present a conservative picture, we re-analyzed our data painstakingly. But as the results of the journal study emerged, it became clear that quarrels about baseline date would be un-ending, so we retained our original figures and merely noted the disagreements in footnotes. These disagreements (coming from the same library system but from different sources) highlight the need for a library to use single, agreed-upon sources of data. This indeed became the policy in the library system under study."

We submit that the important procedural matter of accepting the most inflated figures as base data, placing the blame for this on Pitt libraries and footnoting the inflated figures as described above is not dealt with adequately in the above paragraph (see also our NOTE on page 26).

2.4 Summary

KS is structured, in text and footnotes, in such a manner as to make careful investigation and reporting on it a difficult matter. It contradicts itself, it hedges, it makes accusations and then drops them without retracting them, it is simultaneously aggressive and evasive, it is both censorious and hard to pin down.

3.0 The Kent Study of Book Use at Pitt

This examination of the KS study of book use at the Hillman Library, University of Pittsburgh, is schematic, illustrative, and far from comprehensive. More complete analyses and information can be provided to those interested.

We find ourselves in serious disagreement with KS over its use and manipulation of data on books. We will not list and examine all the issues but rather will offer some typical examples.

3.1 KS Statistics on Book Use

Let us begin by taking KS data on 1969 acquisitions, that year being perhaps more "complete" in its data. KS states that through 1975 "22,172 of the 36,869 items acquired in 1969 had been used at least once (see Final Report, Table 1 for numbers). This total represents about 60% of acquisitions" (page 11).

Let us list first minor additions to this use total. KS dismisses these additions as "an acceptably small error," but let us add them on for the moment. Forty-seven items acquired in 1969 for the Hillman Library were used by Hillman Inter-Library Loan but did not circulate externally at Pittsburgh during the period under study by KS (see Table 16, page 28). In a similar way 329 items were used in the Reserve Book Room at the Hillman Library but did not circulate externally. These minor additions total 376 (1969) items used. Now the 22,172 items used have increased to 22,548 items, or 61.2%, an increase of just over 1% above the KS figure. (The failure to count all Reserve Book Room Uses - each item there was counted as one use - also skews downwards total use statistics in KS.)

Of more importance than the above is "inhouse" circulation or use. Note that we disagree with the KS definition of inhouse use, and consequently with the KS method of selecting the data on inhouse use, and with the data themselves. These disagreements will be explained below. But for the moment

let us accept the KS definition, methods and data, and see where they lead.

KS discussion of inhouse use is based on a 30-day sample of books collected from return shelves and tables, an analysis of this sample, and an extrapolation of the sample to a 365-day, or one year period, including a summer slowdown. In the 30-day sample, 193 items acquired in 1969 were used inhouse, according to the KS definition of inhouse use, but had not previously circulated externally, i.e., between acquisition in 1969 and early 1976. When this group of 193 items was studied for a year after the sample period, i.e., until April, 1977, 12 more items of the 193 circulated externally (tables 11 and 12, pages 24-25). Thus, by April 1977, 181 items from the sample, acquired in 1969, had been used inhouse and had not circulated externally in all that time. Let us now use the KS method of extrapolation to a yearly base (see pages 25-26). Using the 181 items from the 30-day KS sample as our base this yields a total of 1,963 items acquired in 1969 which were used inhouse during one year, but which were not used externally (i.e., circulated) from 1969 through the year 1976.

Now the 22,172 items from 1969 in KS, using its own statistics and extrapolations, have changed to 22,548 items, then to 24,511 items. The percentage of items used shifts from the 60.1% in KS to 66.5%. For the record, let us repeat that we do not agree with the KS definition of inhouse use. We are simply reordering the KS data using its own criteria and figures.

Note also that the KS underestimation of its own "items used" figures for 1969 acquisitions, over 6% so far, is repeated in the other years studied, 1969-1975, as computation can confirm.

/This may be the appropriate place to point out the dangers of extrapolation from a 30-day sample to a one year total in a 7 year study of use. KS presents some 95% of external circulation use, and a 30-day sample of inhouse use, and many, including us, would claim that the KS definition of inhouse

use is incorrect (see below). This helped to produce a biased and unbalanced study.

In order to demonstrate these dangers, let us perform an experiment with this small sample and its extrapolations in mind. We have seen in KS that 181 (1969) items were used inhouse but did not circulate. By the extrapolation method in KS we found that in the last year of the study some 1,963 items were used inhouse but had never circulated to that time. But KS is a 7 year study, and if we take the 1,963 items as a typical year we find that in a period of 7 years at least 13,741 items acquired in 1969 were used inhouse but did not circulate. It could even be argued that this 13,741 is too low. First, according to KS and generally accepted belief, books and monographs are used most heavily in the first 2 or 3 years after acquisition. Moreover, as KS states, the percentage of books and monographs circulating inhouse that also circulates externally increases over time (page 25). Thus, in the early use years of the 1969 acquisitions, say 1969, 1970, and 1971, we should be able to state that much larger numbers of 1969 acquisitions were used inhouse but did not circulate externally. But for the purpose of this exercise let us use the figure of 13,741 items. We now find that 36,289 items (22,548 + 13,741) acquired in 1969 have been used during the study period. This would mean that some 98% of the 36,869 items acquired in 1969 had been used at least once by the end of the study. Obviously this percentage is too high, but it illustrates the dangers of extended extrapolation from a small sample. We also believe that it is closer to the real situation of use in Hillman Library than the 60% (now 66.5%) put forward by KS. Let us continue our review of the data.7

3.2 KS Statistics on the Books Available for Use.

So far we have considered the KS nominators for items used among the books and monographs acquired in 1969. Using KS's own statistics and extrapolations

we find that the total of 22,172 (60.1%) items used is too low, and that 24,571 (66.5%) is a more complete compilation of KS's own data.

Now let us devote some attention to the KS use of the 1969 denominator, which we have accepted hitherto. We find that 36,869 items were acquired in 1969. KS claims (page 10) that it has included a loss rate of 5% per year in its calculations. This is not so (see Tables 1, 2, and 3 of the Final Report).

It is difficult to place lost, destroyed, misplaced, or stolen items in our calculations. It is tempting and amusing, for example, to consider the theft of a book or monograph, as one use, and thus add it to the nominator. But we decided that it makes more sense to deduct lost, destroyed, misplaced or stolen books from the denominator, i.e., these books are not available for use, and thus should be excluded from the total available. It is also difficult to decide on the rate of this loss. It is cumulative and may reach as high as 10 to 15% of a given year's acquisitions after 7 years have passed (see KS, page 45). To be conservative we decided to simply deduct 5% from the denominator, and disregard the cumulative growth of the unavailable number of 1969 books and monographs. The loss of 1969 books is then 1,843. This lowers the number of 1969 books and monographs available for use from 36,869 to 35,026 items. Turning now to our total number of items used, 24,511, we find that the percentage used is now 70% (69.979% to be exact).

Another category of books which was not considered in KS was the reference collection. Much of the reference collection does not circulate, and what circulation there is is usually restricted and, until very recently, manually charged out. In the academic year 1968-1969, 572 additional reference items entered the collections. In 1969-1970, the total was 698 items. (It is worth noting that this number increased greatly in the last years of the KS study. The 1974-1975 total of reference books added, for example, was 1,104.) The

average of these two academic years is 635 reference additions, and so we have assigned this total to the calendar year 1969. As Hillman patrons are aware, although these reference books are seldom checked out, although such external circulation as there is would appear rarely on computerized circulation records, the reference collection is very heavily used. Surely some awareness of such use should be a part of such an account of use as KS claims to be.

Because these reference books and monographs added to the Hillman collections in 1969 are not normally available for circulation or circulation records, we have deducted these 635 items from the denominator for 1969, i.e., the number of items available for computer-recorded use. The number of 1969 items available now becomes 34,391 (36,869 - 1,845 - 635). It will be recalled that the adjusted KS nominator (items used) is 24,511. The percentage of 1969 items used now moves to 71.3%, an increase of more than 11% over the original KS percentage. 1969 is of course, merely representative. The same holds true with slight variations for every year of the KS study and for the accumulated statistics of KS as a whole.

This exercise in data accumulation so far has not questioned any of the basic premises in KS. It simply wishes to demonstrate that KS data as given yield much higher numbers of items used and percentages of use than those put forward by KS. We shall now move to more substantial concerns and examine the KS study of inhouse use and other matters.

3.3 KS Statistics on the Inhouse Use of Books

We have already questioned the wisdom of using a 30-day sample and its extrapolations as the basis for a 7-year study, especially when the "other half" of the study, external circulation, is based on a long and fairly complete record. We also claim, however, that the sampling method is intrinsically flawed, and leads to underestimation of use--as is so consistently

and so disturbingly the case in KS (see above).

Here is the basis of the KS book and monograph internal or inhouse use sampling method.

> "The policy of the Hillman Library is to request that patrons not reshelve material but instead place it in special areas in the stacks or leave it on the table where it was used. Signs are placed prominently throughout the stack area to indicate this policy. We have assumed that patrons obey this rule. Given the long standing of this policy, the special stack area, a systematic collection method, and our more formal notion of 'use', we think that we have faced most of the objections raised by Fussler and Simon to the collection method for studying internal use.
>
> On each of the 30 sample days materials left on tables and designated areas were collected" (Final Report, pages 20-21).

This is a crucial statement. If it is not correct then the part of KS devoted to inhouse use becomes invalid. We were troubled by its vagueness. What were the "more formal notions of 'use'"? What were the "objections raised by Fussler and Simon," and how had they been faced? More important to us, however, was our opinion that such a method of data collection would not catch even a majority of inhouse uses.

Do patrons obey the Hillman request to place materials on tables or designated areas? Several days of observation showed us that many patrons do not. We decided to find out what some patrons perceive themselves as doing as far as this request is concerned. We spoke to members of the faculty, graduate student body, and Hillman Library professional staff (librarians).

We spoke to 57 people from these 3 groups. Seven people answered in ways which we found to be somewhat difficult to categorize. Their answers were of little help: three of these said that they did not use Hillman; one said that he seldom uses Hillman and could not remember what he had done with his books when he was finished with them; and three said that they had not noticed such signs in Hillman!

The question asked of the 57 was as follows:

> "There are signs in the Hillman Library asking you not to reshelve materials you have used, but instead to leave them on tables or on designated shelves in the stacks. Do you do as requested: Always:__Often:__Sometimes:__Seldom:__ Never:__?"

The 50 answers were as follows: Always: 2; Often: 2; Sometimes: 15; Seldom: 27; Never: 4. The worst "offenders" are senior faculty and, especially, librarians (the latter identified by KS as relatively heavy users). Senior faculty believe that they are more careful at reshelving than the library employees charged with this task. Librarians share this feeling and in addition say that it would be selfish to impose the extra work on fellow library workers when they, the librarians, are perfectly able to reshelve. A typical pattern seems to be to go through several books while facing the shelf, reshelving the ones not needed at that moment, or needed only briefly, and to take 1, 2, or 3 books or monographs to a table or to the circulation desk -- for note taking, more comfortable reading because of the availability of chairs, or checking out. Some of the books taken to the tables are left there; others are reshelved when the patron goes to the stacks for a fresh "browse" or fresh supply of books.

As a result of our observations and the above questioning of some library users, we conclude that most faculty, graduate students, and librarians do not obey the signs, and that collecting the books deposited on tables or designated shelves will not give an accurate view of inhouse use. Notably, such a method will fail to capture the browsing function.

It should be mentioned that, while Professor Kent has not replied to many criticisms of KS, he did frame a response to just this point, as it was urged by Professor Jasper Schad.[6] Therefore let us quote the entirety of Professor Kent's response:

> "Regarding reshelved books -- One can take the view that the characteristics of use by those who do not follow the nonreshelving policy are the same or different than by those who do follow the policy. Mr. Schad obviously takes the view that they are different: we took the other view."(7)

It might be urged, in response to this "rebuttal" of Schad, (1) that on a point of such importance it might have been well to discover whether or to what degree patrons follow the nonreshelving policy, (2) that it would have been relatively easy to find this out, and (3) that, since it appears that senior faculty and librarians are precisely those who do the most reshelving, and since these would seem to be the patrons most likely to use those obscure books which are least likely to show up on circulation records, once again a KS decision as to what to count results in an underestimation of use.

It might also be said that KS's failure to take into account the browsing function of such a library as Hillman constitutes a failure, once again, to recognize a distinction between lending and research libraries. Research libraries are specifically designed to facilitate the inhouse, consultative and browsing aspects of research -- thus the "open stack" design and the placing of faculty and graduate studies, tables and chairs within Hillman Library.

One recent study does agree with KS that the number of recorded inhouse uses seems "to be very closely associated" with circulation figures. The study, however, concludes as follows.

> "It became clear . . . . that the method of counting in-library uses greatly underestimated the total amount of in-library use, although the extent of the underestimate varied by subject. Although the actual numbers of uses were not counted, it is clear that the number of books being consulted is approximately twenty times as high as those receiving recorded in-library use. Clearly then, any relegation or withdrawal on the basis of recorded in-library uses (combined with issues /circulation/) would result in many books being removed that would otherwise have been consulted . . . . This does not take account of the nature or seriousness of the consultations, however, and clearly, further elucidation is necessary to discover, in particular, whether the high level of consultation represented use of interesting and relevant stock, or a search

> for interesting and relevant stock" /C. Harris, "A Comparison of Issues and In-Library Use of Books," Aslib Proceedings, 29, no. 3 (March 1977), page 126/.

These conclusions accord with our less formal observations in the Hillman stacks, although we were surprised at the 20:1 ratio and suspect that 5 or 6 to 1 may be closer to the facts at Hillman Library.

To conclude, we find that the KS study of inhouse use is invalid both in the size of the sample, and even more importantly, in the way the sample was gathered. It was based on a use pattern which does not exist among significantly large groups of patrons of the Hillman Library, and it drastically underrepresents inhouse use of books and monographs there. This leads to two observations. Throughout, KS equates circulation with use. Because of the invalidity of the inhouse sample, this repeated assumption/assertion cannot be defended and is, in fact, simplistic and inaccurate. Moreover, taking the 71.3% of 1969 items used, from our previous calculations based on KS, we are confident that an accurate inhouse count of the use of 1969 acquisitions would bring the percentage of such items used to well over 80%. We expect that similar figures and percentages would obtain for the use of the acquisitions of the other years under KS study and for the collections as a whole.

3.4 KS Statistics on Book Aging

We agree with KS that a collection ages; that books are more frequently used when new. But we find that KS overstates the aging process. KS claims that

> "It can be seen from Figure 5 that the percentage of new items entering the circulating collection peaks in the first year and then rapidly declines. In addition, the data from Table 1 indicates that the decline is roughly 50% from one year to the next." (Final Report, page 17)

In fact, KS' statistics show that the decline from year to year is 35.8%. Moreover the yearly drop becomes much less as a given year's acquisitions

age. We followed our 1969 acquisitions for two years beyond the conclusion of the KS study. In 1976 6,208 items acquired in 1969 circulated 10,724 times. In 1977, 5,854 items acquired in 1969 circulated 10,001 times, very small declines indeed for 8 or 9 year old items. The whole question of aging and "obsolescence" in Hillman's collection has been little more than begged in KS; what is said as regards these problems, however, once again serves to underestimate the use of the collection.

3.5 KS Statistics on the Costs of Book Use, "High" and "Low" Risk LC Classes, etc.

Since KS consistently underestimates book use, KS statistics on costs per use, per item, per LC class, etc. are invalid. In fact the costs per use, etc. must be lower -- probably considerably lower -- than KS reports them to be.

3.6 An Overview of KS of Book Use at Pitt

The number of books reported to be available for use at Hillman is uniformly overestimated and the number of books used is uniformly underestimated.

The root hypotheses which Professor Kent and his associates set out to investigate were as follows:

> " . . . a study was designed to develop measures for determining the extent to which library materials are used and the full cost of such use. It was our expectation that much of the material purchased for a research library was little or never used, and that the costs entailed are beyond ordinary expectations."

Since all biases in KS statistics are consistent with its root hypotheses, we feel that the defects in the methodology and execution of the study of book use at Pitt justify concern about its objectivity.

4.0 The Kent Study of Journal Use at Pitt.

This section examines KS statistics on the number of journals available foruse and KS statistics on journal use.

4.10 The Statistics on the Number of Journals Available for Use.

4.11 The Base Figures on the Number of Journals are Inconsistent.

The Progress Report, the Galvin-Kent article in Library Journal, and the Berry editorial in Library Journal use "paid subscriptions" as base figures, while the Final Report switches to a new base figure, "the periodicals/serials holdings list." The Final Report provides two sets of figures for periodicals/serials holdings lists: (1) the so-called "official figures" and (2) the so-called "librarian's figures."

The following quotation from the Final Report (p.59) describes the double set of figures for the periodical/serial holdings list:

"The number of titles in the entire collection was:

Library	Official Figures	Librarian's Figures
Physics	298	298[1]
Life Sciences	914	835
Engineering	1643	829
Chemistry	433	402
Computer Science	198	148
Mathematics	265	181"

4.12 The Base Figures are Inaccurate.

The lists of "paid subscriptions" for the year of the Kent Study are reported to be 687 at Bevier Engineering Library,

507 at Langley Life Sciences Library, 298 in Physics Library. The correct figures for that year reported to us by the Bevier, Langley, and Physics libraries are somewhat lower: respectively, 633, 481, and 253.

The so-called "official figures" for periodical/serial holdings lists are admittedly inaccurate since, as KS tells us, they include: microforms purchased in lieu of binding (Final Report, p.59 quoted above), abstracts and indexes (Final Report, p.107 footnote 1), various monographs and books under Library of Congress classification, various reference tools used by the library staff (e.g., Books in Print, Publishers' Trade List Annual, Cumulative Book Index, etc.), journals which changed titles without any substantive content change (This is common in engineering where some journals have changed names ten times since 1966 and one journal changed its name twice in four months), discarded items (e.g., various 4-page news bulletins), and so forth. (For a more detailed discussion of this matter see: Homer I. Bernhardt, Pitfalls of the Pitt Study.)

According to the Bevier Librarian, it would be physically impossible to fit 1643 journal runs into the seven stacks (686 shelves) allocated to his bound journal collection. And the Langley Librarian reports a holdings' list of 883 items at the time of KS study (vs. 835, given as the "librarian's figure" in Professor Kent's Final Report, p.59).

Langley's holdings list of 883 items for Fall, 1976, includes 191 books and monographs, 41 indexes/abstracts,

152 "no longer published", "cancelled", "dead gift items ", "changed the title", etc. There is no way in which this list can be regarded as the correct list of journals.

Similarly, Bevier's so-called "librarian's list" of 829 items includes: 50 microform subscriptions purchased in lieu of binding, 57 indexing and abstracting publications, 5 journals on order but not yet received, 44 journals which changed the title, etc. Again there is no way in which this list can be viewed as the correct list of journals at Bevier. (For a more detailed discussion of this matter see: Homer I. Bernhardt, Pitfalls of the Pitt Study, cited above)

On the basis of the above considerations, we feel that the so-called "official figures" are very inaccurate and the so-called "librarian's figures" a rough approximation. The former are quite harmful in their effects because they distort (1) all subsequent computations on the ratio of journals used to journals available for use and (2) all cost figures comparing the cost of journals used with the cost of the journals available for use.

We feel that the matter of correct data baselines is a serious one and that the following statement by Professor Kent in the "Preface" to the Final Report (page iii) fails to dispose of it:

"But as the results of the journal study emerged, it became clear that quarrels about baseline data would be un-ending, so we retained our original figures and merely noted the disagreements in footnotes."

This statement does not describe accurately what actually occurred. It is not a fact that the original data baseline was retained. On the contrary, it was departed from. The original data baseline was "the list of current subscriptions" (see the Progress Report, Galvin-Kent article, the Berry Library Journal editorials). This original data baseline was changed in the later part of the investigation and a new data baseline, the list of periodicals/serials holdings, was substituted for it. The new data baseline was available in two versions: the so-called "official" version and the so-called "librarian's" version. While both lists are inadequate as data baselines for reasons stated, the first or "official" one portrays the use of journals at Pitt and the cost of such use even more pejoratively and inaccurately than the second (especially in the case of Bevier where the "official figure" is twice the size of the "librarian's figure"). To our regret and surprise this is the base figure utilized in the Final Report (Final Report, p.59).

NOTE: We have been told by various librarians that the "official figures" were turned over to KS with explicit warnings about their inaccuracy, and Homer Bernhardt, the Bevier Librarian, asks the following perturbing questions regarding this matter:

"Why did the 'Kent Study Team' knowingly use incorrect data when they knew it was erroneous midway through the study?

The explanation given in the Final Report (pp.59-60) is not satisfactory:

'There was considerable discussion of the precise number of titles in the journal collections for the science and engineering libraries. The figures from the official serials record are listed under 'Official Figures' above. The departmental librarians said that there were fewer titles actually in the collections, and their figures are listed under 'Librarian's Figures'. In some cases, the discrepancy is not insignificant, as in the Engineering Library . . . However, in the interests of consistency, the decision was made to use the official list wherever possible. . . . we have not recalculated our figures, which are based on the 'official' count. We have included the librarians' figures so that the interested reader may be in a position to recalculate the percent of usage if he wishes to do so. . . .'

How can they justify that statement when the "official" serial record count was explained to them at the time they received it?" (Homer I. Bernhardt, op. cit., p.7)

4.20 The Statistics on the Use and Non-Use of Journals.

The sampling techniques were as follows:

"Two separate methods were used in order to select the hours in which to sample the libraries. In the case of the Physics Library, the librarian was consulted as to 'heavier hours of usage'. A stratified sample was used which emphasized these periods. In the case of all other libraries, the libraries were 'pre-sampled' for one week, at one hour intervals, in order to determine the distribution of usage. The assignment of 'observation periods' was then made in accordance with this distribution.

Once a schedule of one-hour or one-and-one-half-hour observation periods had been made for an entire trimester (two trimesters for Physics and Engineering), data collectors were sent to collect the data during these hours. One observer was assigned to a library in any one observation period. There were two to four observation periods a week, depending on the library in question. Thus, the samples included only a certain percentage of the actual operating hours of the library. The approximate percentage of sampling hours per open library hour for each library was:

Physics	1/15th of the total weekly hours
Life Sciences	1/30th of the total weekly hours
Engineering	1/25th of the total weekly hours
Chemistry	1/25th of the total weekly hours
Computer Science	1/25th of the total weekly hours
Mathematics	1/20th of the total weekly hours"

(Final Report, page 53).

The above sampling techniques are incorrect for the following reasons:

4.21: We have observed the use of journals at Bevier and Langley and we assert that a single observer could not possibly record the simultaneous use of journals in several stacks and in other library locations (e.g., the duplicating machines), particularly during the "heavier hours" of attendance.

Thus, we wish to take clear issue with KS statement that:

"While the number of hours of observation was set, the number of uses recorded in each hour was unlimited. If usage was light, as few as 2-5 uses might be recorded; if usage had been heavy, conceivably any number of uses could have been recorded. (We say "conceivably" because the actual usage was never so heavy as to cause us to consider putting on a second observer in order to handle the overflow of interviews, although we kept a cadre of trained data collectors available for this purpose.)" (Final Report, p.53).

4.22: The "base figures" used in the Final Report include: microforms, abstracts, indexes, books, monographs, reference works, etc. However, their use was not covered and recorded by the observers. (See Final Report, p. 59 and footnote 1 on p. 107). Thus the base figures and the survey do not match. (The sampling of use at Bevier, Langley, and Physics was conducted when the base figures were the lists of current subscriptions. The sampling at other libraries: Chemistry, Mathematics, and Computer Science was conducted when the base figures were the periodica /serials holdings list. See also: Homer Bernhardt, op. cit.)

4.23: We consider that the hours of heavier journal usage were not properly determined. The pre-sampling procedure described above (our p. 27-28) samples for heavier attendance of the library and not for heavier usage of the journal collection. The two are neither equireferential nor synonymous. What we do know is that many undergraduate and even graduate students use Pitt science libraries as study halls during certain hours of the day and during certain periods of the academic year. They go to the library not in order to read journals but the reading matter which they have brought along, or they come to consult standard reference books while working on written assignments or to use library facilities other than journals (e.g., books, duplicating machines, vertical files of research reports, vertical files of photocopies of journal articles). The library may be crowded without there being much use made of the journals in the collection. We consider that KS's hidden assumption which equates heavier attendance with the heavier usage of the journal collection is not well-founded and cannot be accepted at face value--particularly associated as it is with other provable inadequate methodological procedures.

4.24: A pre-sampling period of one week (seven consecutive days) is not adequate to determine "the hours of heavier usage" (however defined) over an academic term or a fortiori over a whole academic year. The use of a journal collection is not uniform from week to week but a complex function of:

- the courses offered during a particular academic term or year;
- theses and dissertations (proposed and in progress);
- faculty research and teaching;
- preparation of proposals;
- and several other factors such as weather, examination dates, national holidays, etc.

There is no way in which a pre-sample of seven consecutive days could possibly provide a valid specimen of usage during an academic term, to say nothing of an entire academic year [e.g., a Physics faculty member has this to say about the fluctuations in library use:

" . . . when writing a research proposal, or paper, the use of journals may be extraordinarily heavy for a few days. Thus, it would not surprise me to find that 90% of an individual's annual journal use occurs during a ten day period, with only 10% occurring during the remaining 350 days. This could have important consequences in the size of fluctuations in the use, and may automatically exclude the hours and time during the year when the KS study was carried out in the Physics library (the comparison of Fall-Winter term use with Spring term use that KS made for Engineering, should not have been assumed to carry over to Physics)"].

4.25: The emphasis on the peak hours of library attendance biases the samples toward undergraduate student uses and away from faculty uses, doctoral student uses, post-doctoral uses, etc. This technique effectively de-emphasizes the usage of the bound journals for it is known that some types of journal users will shun the hours of heavier attendance and come to the library when it is poorly attended so they can spread out the bound journals with which they are working.

4.26: In the case of Bevier, the sample fails to capture the behavior of part-time graduate students who work in industry (over 50% of the total of the graduate students in engineering)

and who frequently—instead of coming to Bevier and using the journal collection *in situ*—obtain photocopies of journal articles from Bevier via their companies' special libraries.

4.27: In the case of Chemistry, Computer Science, and Physics libraries, the KS sample fails to capture the behavior of the faculty and the graduate students. In all three departments, the faculty and the graduate students are issued library keys and frequently visit the library during the hours when it is closed to the general public. A faculty member has written us:

"I, myself, use the journals almost exclusively off hours, and I suspect the same is true for many of my colleagues."

4.28: At both Bevier and Langley, as soon as a journal article has been assigned to be read by a class, it is duplicated and put in the "vertical file." From then on, most users will access the article in the vertical file and *not* in the journal. This type of journal use was not investigated. Although the *Progress Report* states (p.24) that

"Both Langley and Engineering have vertical files, which contain photocopies of journal articles. These files were not included in the observation statistics, but will be studied in order to ascertain the usage of these files in terms of frequency and specific titles. This can be done by examining the records kept at the checkout desk,"

there is no further mention of this important matter in the *Final Report*. This constitutes a serious bias and omission, and must result in data which, once again, underestimate use in accordance with KS expectations.

4.29: Because journals are bound into volumes the use of several consecutive issues of a journal was counted by KS as several uses *before binding* and as a single use *after binding*.

This biases statistics to recent issues.

4.3 The Word "Sample" is Used in Two Different Senses

The Progress Report, the Galvin-Kent article, the Library Journal editorial and several other written and spoken statements by Professor Kent and his co-workers use the term "sample" in the sense of "specimen," that is, "a part of anything shown as evidence of the number and quality characteristic of the whole." Thus, the figures obtained in various samplings are presented as characteristic of general use and non-use of journals at Pitt. This customary but in this case erroneous interpretation of the term "sample" provides a basis for dramatic and well-publicized statements such as:

"We have been surprised by the extent of non-use of most journals in science and engineering."(8)

"Of 298 current journals subscribed to by the Physics Library, only 37 percent (110 titles) accounted for all journal use in the sample." "In Life Sciences . . . of a total of 507 journals subscribed to, only 21.5 percent (109 titles) were used during the sample period. Fifty-one journals, 10 percent of the total current collection, provided for 70 percent of all use." (9)

"Engineering students use only nine percent of journals bought for them; physics students, only 37 percent; and students of life sciences and psychology, 22 percent." (10)

"The most striking observations relate to engineering journals, where 8.4 percent of the total current collection, 58 of 687 titles accounted for all observed journal use." (11)

On the other hand, the Final Report backtracks from these assertions without retracting them (page 63):

"Projecting Yearly Percentage of Usage: By graphing the data (method described in the Appendix), we can project the sample usage into yearly usage. The results show that most of the titles in a collection will eventually be used, but only very few titles will be used a great number of times.

The fact that nearly all titles eventually get used can be seen by considering the percent of the collection having at least two uses of a given title:

Library	% of Collection Used 2 or more times per year
Physics	95.5
Life Sciences	97.3
Engineering	84.0
Chemistry	97.0
Computer Science	>98.0
Mathematics	>98.0"

This is a striking departure from the widely publicized earlier statements about non-use of journals and from the previous definition of the term "sample." This procedure of shifting the definition is well known in logic as "the fallacy of equivocal definition." It has no place in serious scientific discourse.

The next paragraph changes "non-use" to "small usage" seemingly en passant (Final Report, p. 63):

"Note, however, that this is based on "titles used", not on volumes. A given title will have anywhere from a few to several hundred individual volumes, depending on frequency of publication and the number of years the library has subscribed to it. Seen in this light, a usage of "at least two times" per title is small usage indeed."

This procedure is well known in logic as the "fallacy of changing the subject." Again, it has no place in scientific discourse.

4.4: KS reports provide a variety of very precise figures on the use of Pitt journal collections and on various costs associated with such use:

TABLE 34 (Final Report, p. 62)

Number of Sample Uses	Percent of Collection Supplying That Usage			
	Life Sci.	Chemistry	Computer Sci.	Math
10 or more	0.0	0.6	0.0	0.0
5 to 9	0.5	0.9	0.5	0.0
2 to 4	5.1	4.7	1.0	1.9
1	6.3	8.3	7.1	6.4
0	88.1	85.5	91.4	91.7
	100.0	100.0	100.0	100.0

Average Cost Per Use

Library	Journals used during sample period	Entire Collection
Physics	$1.83	$3.50
Life Sciences	$0.66	$2.52
Engineering	$1.25	$6.81
Chemistry	$0.95	$2.69
Computer Science	$0.36	$2.68
Mathematics	$1.32	$7.54

(Final Report, p. 67)

As explained above and in 4.7 below these figures do not provide a correct description of either journal use or of the costs of such use at Pitt, but their high level of precision constitutes a suggestion of a very high level of correctness indeed, a suggestion that is hardly warranted by the methodology (some statisticians refer to this statistical procedure as "the fallacy of spurious precision").

4.5 Both Sample Figures and Projections to Annual Figures are Wrong.

"Projected Yearly Usage: Using the multiplying factor mentioned above [Section III, B.2.c.], we can project a yearly usage for each library as follows:

Library	Sample Uses	Projected Yearly Usage	Rounded
Physics	439	9879	9900
Life Sciences	211	19413	19400
Engineering	172	6579	6600
Chemistry	160	12288	12300
Computer Science	24	1842	1850
Mathematics	30	1890	1900
	3683	51891	51950" (Final Report, p. 58).

a. Sample Uses

As shown above, KS sampling techniques are based on an inadequate experimental design; hence the so-called "Sample Uses" listed above are not actual samples in the usual meaning of this term and considerably bias KS's account of journal use at Pitt.

b. Projected Yearly Usage

The extrapolations to yearly usage are known to be wrong. They were computed by the following techniques (Final Report, pp. 192-193):

"We developed a 'multiplying factor' to project the sample usage into yearly usage. The trimester multiplying is based on the percentage of time sampled. For example, if we sample 30 hours per trimester, and the library is open 600 hours per trimester, the trimester multiplying factor is 20.

The trimester multiplying factors we used were:

TABLE A6 p. 193

LIBRARY	Hours Open Weekly	Week * 15 = hrs. open per trimester	Adjustment if necessary	Hours Sampled	Trimester Multiplying Factor
Physics	60.00	900	no adjustment	60	15
Langley (Life Sci.)	79.75	1196.25	no adjustment	39	30.67
Engineering	68.75	1031.25	2062.5 (2 trim.)	81	25.5
Chemistry	66.50	997.5	no adjustment	39	25.6
Computer Science	66.50	997.5	no adjustment	39	25.6
Mathematics	54.50	817.5	no adjustment	39	21.0

Note: The Engineering Library was the only library with a different number of hours in each trimester sampled (39 and 42); thus, we adjusted the Engineering totals to two trimesters before dividing by the number of sampling hours.

TABLE A7

Projected Trimester Usage

LIBRARY	Sample Usage	No. of Trimesters in sample	Normalized Trimester Usage	Trimester Multiplying Factor	Projected Trimester Usage
Physics	439	2	219.5	15	3293
Langley (Life Sci.)	211	1	211	30.67	6471
Engineering	172	2	86	25.5	2193
Chemistry	160	1	160	25.6	4096
Computer Science	24	1	24	25.6	614
Mathematics	30	1	30	21	630
TOTAL	1036				5297

TABLE A8

Projected Yearly Usage

LIBRARY	Trimester Usage	Trimester * 3	Rounded to nearest 50
Physics	3293	9879	9900
Langley (Life Sci.)	6471	19413	19400
Engineering	2193	6579	6600
Chemistry	4096	12288	12300
Computer Science	614	1842	1850
Mathematics	630	1890	1900
TOTAL	17297	51891	51950

We are unable to accept this projection technique because:

- sample usage is known to be both much too low and biased due to faulty sampling techniques and experimental design;
- the multiplying factor is too large to warrant confidence (e.g., Engineering: from 81 hours to 1031 hours; Life Science: from 39 hours to 1196 hours), especially when used in association with a faulty sampling technique;
- an alternative mode of computation based on another methodology provides much larger projection figures: for example, the number of yearly uses of journals at Bevier projected by this procedure is at least 30,000 and not 6,600, as stated in KS. The alternative mode of computation estimates that the ratio of journals reshelved by the users to the journals reshelved by the library staff is 4 to 1. Since the number of journals reshelved by the library staff during the academic year 1977-78 was 6,000, the projected annual use for that year is 30,000 or more (24,000 + 6,000).

4.6 The Quality of Samples and Extrapolations from Samples is not Tested.

Contrary to recommended statistical norms, KS does not provide the standard evaluations of the quality of its statistics.

4.7 The Statistics on the Costs of Journal Use

The above sections show that KS statistics on the base figures and the use of journals are markedly inaccurate. Since the base figures are markedly inaccurate, therefore, the reported subscription costs which are based on these base figures are also in-

accurate. This is so because in addition to the journal subscription costs, they include the costs of various books, monographs, indexes, abstracts, microforms, etc. Only some of these inaccuracies are accounted for in the form of footnotes in the Final Report (p. 107, footnote 1 and page 111, footnote 7).

Since the statistics on the use of journals are inaccurate, therefore the statistics relating the reported subscription costs of journals to their reported use are also inaccurate.

Finally, since the statistics on the use of journals are inaccurate, therefore the statistics relating the reported total costs of journals to their reported use are also inaccurate.

4.8 All KS reports and the Galvin-Kent article define the benefit from a journal title as its frequency of use. This assumption is phrased as follows:

"In assessing cost/benefit, this study has defined 'benefit' in terms of actual use of materials, relegating museum (or archive) value to an unaffordable category. The study has been conducted in the environment of the University of Pittsburgh library system dealing with two types of materials: (1) journals; and (2) books and monographs" (Progress Report, p.3).

This view is simplistic; indeed, it constitutes a claim that the relatively infrequent use of a journal such as Nuclear Physics makes it less beneficial to the user community than very frequently used journals such as Nature and Science. This may be the proper place to point out that it is not a fact that all journal uses are commensurable. There are many significantly different types of journal uses and each type should have been investigated by appropriate, possibly separate methods, and counted separately.

Members of different sets, the proverbial "apples and oranges" are not additive. KS counts them together, and this constitutes yet another serious methodological flaw.

4.9 There is a Strong Correlation Between KS's Root Hypotheses, on the One Hand, and the Biases in its Baseline Data and Sample Data on the Other.

The root hypotheses formulated and tested by KS were, once again, as follows:

> "And so a study was designed to develop measures for determining the extent to which library materials are used and the full cost of such use. It was our expectation that much of the material purchased for a research library was little or never used and that the costs entailed are beyond ordinary expectation" (Final Report, page ii; See also Final Report, page 176 and Progress Report (Abstract)).

Again all biases in KS statistics are consistent with its root hypotheses. As shown above, the statistics on the number of journals available for use are uniformly overestimated, while the statistics on the use of journals are uniformly underestimated. We feel that the defects in the methodology and execution of the study of journal use at Pitt cause legitimate concern about its objectivity. We regret to report that some prestigious Pitt faculty members believe that KS is not research at all, that it was set up to yield a certain result, and that, not surprisingly, it did.

5.0 SLC Conclusions vs. KS Conclusions--and Some Recommendations

As shown above, KS's results simply do not support the validity of its root hypotheses, that "much of the material purchased for research libraries was little or never used, and that when costs are assigned to uses, the cost of book use will be unexpectedly high." Even tailored as they are to a uniform bias, KS's own voluminous statistics do not validate these hypotheses. We therefore concur with Pitt's Faculty Library Representatives who concluded that despite its "sheen of objectivity," KS is a "highly subjective and political document," which should not be allowed to affect the management of Pitt's or any other library "seriously committed to the advancement of learning."(12)

We are similarly in agreement with Professor Jasper G. Schad, Director of the Library/Media Resources Center of the Wichita State University, as he contends that KS sheds "no light" on the questions of how collections ought to be built or what expenditures might be justified. "The study is based on incorrect and incomplete data that lead to meaningless conclusions."(13)

5.10 KS Study of Book Usage

5.11: KS confuses the functions of lending and research libraries, and so we agree with Professor Melvin J. Voigt, University Librarian Emeritus of the University of California at San Diego and editor of Library Research and several other publications who argues that "as academic library statistics bear out" the kinds of computer-accessible circulation figures which KS relied upon reflect primarily the use "by undergraduates and others not involved in research." We agree that it seems "obvious" that the use of any multimillion-volume research facility "can be meaningfully studied only by concentrating on that research use,

not on statistics hopelessly distorted by the intensive use of those relatively few volumes used heavily by undergraduates."(14)

5.12: The SLC disagrees with KS's assumption that frequency of "use" is a "good," and that measurement of frequency of "use" leads to a better assessment of how to provide more "good." University and research libraries are only partly structured to please the customer. They are also, and very fundamentally, didactic and pedagogical institutions. In spite of failures and discouragements, teachers are devoted to changing or improving the store of knowledge of their students. To use an example, it is verifiable that the most recent novel by Harold Robbins is "used" many more times than the most popular edition of Kant's Critique of Pure Reason. Public lending libraries should act accordingly, but university libraries should not buy multiple copies of Robbins and relegate Kant to storage.

Even among pedagogical institutions there are various types. The kind of library needed by a two or four year community college may not be the same as the kind necessary for the adequate functioning of a large research university with many graduate schools and research institutes. What is the nature of a research library? Is 50%, 60%, or even 20% an appropriate circulation record of use over 5, 8, or n number of years? In fact what constitutes a satisfactory record? KS does not consider any of these questions, but simply asserts that "much" of the collection is "little" used. For a research scholar these value-laden terms have little meaning.

5.13: KS's suggestions as to the weeding of the Hillman collections should not be acted upon. There are several reasons for this. Consider first KS's own statistics. According to Table 11 (Final Report, page 24) some 25% of the items used inhouse had never circulated externally. About half of these inhouse items that had not circulated were acquired in 1969 or earlier. 3,320 antedated

1968. These books, used inhouse but never circulated, would have been weeded according to the Proposed Weeding Rule (Final Report, page 43) which concludes ". . .weed only those books seven years old or older that have not circulated." Let us consider next KS's study of inhouse use. It is our belief that this section of KS underrepresents inhouse use, and invalidates the contention that circulation = use. Again, we fear that if the KS circulation-linked weeding rule were applied to Hillman Library's collections many books used inhouse would be removed. Furthermore the KS weeding plan is entirely retrospective. It eliminates the librarian who spots a future interest in previously little used material. It eliminates the faculty member who wishes to design a new course from previously unknown material. In fact, the weeding suggestion is based on the curious proposition that if users are eliminated from the decision making process whereby books are kept, stored or discarded they will actually be more contented patrons. As Professor Voigt put it, KS's proposals for weeding are alright for any library that allows "little or no research." But for a library at "a research-oriented university" KS's proposals "would be a disaster."(15)

5.20 KS of Journal Usage

KS wholly misrepresents the use of science journals at Pitt and KS conclusions and recommendations based on their statistics of journal usage are simply invalid. As Professor Voigt put it,

> "The pattern of scientific journal use that your study reports is so different from what one normally finds in scientific libraries that it must be assumed that (1) Pittsburgh is different, with journals being used in other libraries in the area or in departmental or office collections, or (2) there is little research activity in these fields, or (3) that the methodology is faulty."
>
> "If your figures on use of science journals (pp. 2319-2320) are correct for the University of Pittsburgh, Pittsburgh must be slipping badly as a research institution. My observations, admittedly casual, but nevertheless significant, in the Science and Engineering Library at UCSD indicate that issues of at least 90 percent of the titles on current journal shelves are used at least once a week (many, of course, dozens of times)

> and that it is unlikely that there are any titles that are not used at all prior to removal for binding."(16)

We are in a position to provide answers to Professor Voigt's quandary: (1) It is not a fact that Pittsburgh is different with respect to journal usage; (2) It is not a fact that there is little research in the five science libraries investigated by KS; (3) It is true that KS methodology is faulty.

A summary discussion of some unacceptable KS statements and recommendations concerning the usage of journals at Pitt follows.

5.21: All KS reports assert that a fundamental goal of this journal study was:

(1) the development of a methodology that would provide librarians with a simple way of determining the patterns of journal use and

(2) the application of this method at Pitt in order to:

(a) determine Pitt patterns of journal use and

(b) test the validity of the methodology.

All KS reports state that these goals have been met. As a matter of fact, the Final Report devotes an appendix (pp. 184-243) to a detailed account of how the methodology for determining the patterns of journal use was developed at Pitt and how it can be applied at other academic institutions. Based on our observations in Section 4.0 above, we reject KS's view that its methodology for determining the patterns of journal use is valid and transferable.

5.22: KS's Final Report states (p. 179):

> "Also, confronted with use data on journals, alternatives to local completeness may be considered, particularly those involving 'de-acquisition' (removal to lower cost storage facilities) and resource sharing arrangements with other institutions."

We regret that we cannot accept or encourage the acceptance (or for that matter the rejection) of this recommendation because:

- it is based on markedly inaccurate KS statistics of journal use;
- it is based on markedly inaccurate statistics of the costs of journal use;
- it is based on the assumption that the costs of resource sharing are less

than those of local ownership--an admittedly unproven assumption:

> "In considering resource sharing alternatives to local holdings, many patrons express uncertainties--uncertainties which are not relieved by rhetoric alone. Substantial evidence needs to be provided" (Final Report, p. 179).

5.23: The Final Report makes the following recommendation concerning the binding of journals:

> "Considering the rapid drop-off in use of journals with age, fewer journals should be permanently bound. This would not only reduce costs, but would reduce frustration caused by needed materials being in the bindery as many temporary bindings can be accomplished in-house" (p. 179).

However, according to the librarians with whom we have discussed this recommendation, its adoption would not be cost-effective, due to the additional costs associated with additional record keeping, additional reshelvings, additional proneness to misplacement of journal issues, additional proneness to theft, additional wear-and-tear, etc.

5.24: KS states:

> "The results of the current study also have implications for publishers. Decisions which may be made to reduce the number of publications purchased will lead to reduction of print runs and further price increases for the smaller number of copies which must then carry the burden of the basic publication costs. This, of course, could lead to a price increase spiral. Recommendations have been made that publishers take on the business of 'leasing' their publications, instead of outright sale. The few publishers that have been checked believe this to be an unprofitable approach. Should this turn out to be the case, the implication, other than ceasing publication of some materials, would be to package information products in different, less costly, forms, or changing the nature of the products substantially" (Final Report, p. 179).

We regret that we cannot accept or encourage the acceptance— or for that matter the rejection — of this "implication for publishers" since it is based on:

- markedly inaccurate statistics of book and journal use;
- markedly inaccurate statistics of the costs of book and journal use.

Furthermore, microfilm, microfiche, and "online access"--the three presently most obvious alternatives to print--have many problems of their own.

5.25: The Final Report provides the following recommendation for the University of Pittsburgh (p. 176):

> "For the University of Pittsburgh there are both short — and long — range implications. From a university perspective the administration must be permitted to understand the impact of its investment in the University libraries. Similarly, journal usage must also continue to be monitored. The study indicates that journal usage varies widely among the science and engineering libraries. Now that a mechanism exists for tracking journal usage, these librarians have a tool for tracking changes as they are made. Journal use studies will be needed in the other campus libraries. In addition, the library administrators will be able to judge the book/journal collection balance because of the data on the journal collection and its usage, as well as data on the book and monograph collection and its usage."

For reasons stated in our Section 4.0, we believe that KS provides no mechanism for tracking journal usage at Pitt or elsewhere, that its description of journal usage at Pitt is inaccurate, that the studies of journal use in other Pitt libraries should not be patterned after this study, and that KS's study of journal use does not begin to create a measuring device on which sound administrative decisions can be based.

5.3 KS's Implications for Further Research

This may be the proper place to note, for the benefit of other researchers with dull theoretical axes to grind that the replication of one biased study by one or more similarly biased studies does not constitute a validation of the first biased study; neither will such secondary studies close the credibility gap opened by the first.

5.4 The Implications of KS for Our University Environment

Those who have read this far will perhaps allow us one fleeting analogy with the course of modern civilization. All too often we have refused to consider the consequences of some new technology or promotional scheme until it bares its fangs. When the fangs are in view and drawing closer, we set about to find ways to minimize the hurt. In this way we merely buy time, ignoring the source of the hurt -- and rely on the abilities of our civilization to develop means of coping with crisis situations.

KS is a clear threat and a present danger. The curtailment of library acquisitions which KS is an attempt to justify must push us, willy-nilly, into ever heavier dependence upon materials sharing (interlibrary loan, in oldspeak). Researchers can manage when the percentage of materials which must be obtained by interlibrary loan or from storage is small. As the percentage grows, research soon becomes impossible. The "developers" may do grave damage to our research libraries by their insistent promotional activities on behalf of materials sharing. They simply do not begin to explain what might be the consequences, the social costs, of the shifts they recommend. The natural consequence of the impairment of our library environment will be the impairment of our research and teaching.

Given this conclusion, and given all of the other problems of methodology and bias which we have been troubled to recount, we urge that University administrators and librarians not be influenced by the unfounded criticisms and unwarranted recommendations expressed so forcibly by Professor Kent and his associates in their several reports.

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(2) "Pitt study pegs faulty acquisition patterns," an editorial, Library Journal, July 1977.

(3) "Pitt and the pendulum," signed editorial by John Berry, Library Journal, November 15, 1977.

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(5) "Pittsburgh University Studies of Collection Usage: A Symposium," Journal of Academic Librarianship, May, 1979.

(6) Jasper G. Schad, "Missing the Brass Ring in the Iron City," Journal of Academic Librarianship, op. cit., p. 60.

(7) Allen Kent, "A Rebuttal," Journal of Academic Librarianship, op. cit., p. 69.

(8) Progress Report, p. 2.

(9) Thomas J. Galvin and Allen Kent, op. cit. [see ref. (4)].

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(11) Thomas J. Galvin and Allen Kent, op. cit. [see ref. (4)].

(12) Faculty Representatives (Richard Blackett, Paul Guyer, Steve Maczko, and Bert Rockman), "A Comment on 'A Cost-Benefit Model of Some Critical Library Operations in Terms of Use of Materials' by Allen Kent, et al.," Mimeo: University of Pittsburgh, February, 1978.

(13) Jasper G. Schad, op. cit. [see ref. (6)].

(14) Melvin J. Voigt, "Circulation Studies Cannot Reflect Research Use," Journal of Academic Librarianship, op. cit., p. 66.

(15) Melvin J. Voigt, Letters to Professors Kent and Galvin, December 2, 1977, and May 30, 1978, quoted with the author's permission.

(16) Melvin J. Voigt, Letters, op.cit.

Selected Bibliography
(in order of publication)

KS has generated considerable controversy, and some of it has been published. For readers who wish to read further on the matters discussed above, the following select bibliography should provide a starting point. (Some of these materials are not easy to find. Copies may be obtained from: Chairman, Senate Library Committee, Hillman Library, Rm272; University of Pittsburgh, Pittsburgh, PA 15260.)

(i) Kent, A., et al., A Cost-Benefit Model of Some Critical Library Operations in Terms of Use of Materials, Progress Report, April 1, 1977 (Revised April 29, 1977), 42p.

(ii) "Pitt study pegs faculty acquisition patterns," an editorial, Library Journal, July, 1977, p.1438.

(iii) "Pitt and the pendulum," signed editiorial by John Berry, Library Journal, November 15, 1977, p.2316.

(iv) Thomas J. Galvin and Allen Kent, "Use of A University Library Collection, A Progress Report on a Pittsburgh Study," Library Journal, November 15, 1977, pp.2317-29.

(v) Faculty Library Representatives: (Richard Blackett, Paul Guyer, Steve Maczko, and Bert Rockman), "A Comment on 'A Cost-Benefit Model of some Critical Library Operations in Terms of Use of Materials' by Allen Kent, et al.," mimeo: University of Pittsburgh, February, 1978, 10pgs.

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(vii) University Times, Department of News and Publications, The University of Pittsburgh, two articles entitled, respectively, "Library Study Questions Affordability" and "Critics Charge Supermarket Mentality," March 23, 1978, pp.2 & 4; also Letter to the Editor by Professor Bert A. Rockman, April 20, 1978, p.3.

(viii) Harold J. Ettelt, "Book Use at a Small (Very) Community College Library," Library Journal, November 15, 1978, pp. 2314-15.

(ix) Neal K. Kaske, "Library Utilization Studies: Time for Comparison," Library Journal, March 15, 1979, p.685.

(x) "Pittsburgh University Studies of Collection Usage: A Symposium," Journal of Academic Librarianship, May, 1979, pp.60-70.

(xi) Homer I. Bernhardt, "Pitfalls of the Pitt Study," American Society for Engineering Education, Annual Conference Proceedings, June 25-28, 1979, Louisiana State University, p. 19, Event #3242 (available from: American Society for Engineering Education, 1 Dupont Circle, Suite 400, Washington D.C. 20036).